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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/994,010	01/23/2002	Toru Tanikawa	23700.00110	1307

7590

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EXAMINER

TUGBANG, ANTHONY D

ART UNIT

PAPER NUMBER

3729

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/994,010

Applicant(s)

TANIKAWA ET AL.

Examiner

A. Dexter Tugbang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 8-14 is/are pending in the application.
- 4a) Of the above claim(s) 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/423,793.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Species A, Figures 5A-6D, Claims 8-13 in Paper No. 5 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claim 14 has been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 6.

### ***Drawings***

3. The drawings are objected to because Figure 11 should be labeled as --Prior Art-- and Figure 12 is missing from the application. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

4. The abstract of the disclosure is objected to because the abstract is not directed to the claimed invention, i.e. Species A. Correction is required. See MPEP § 608.01(b).
5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: A Method of Manufacturing an Ink-jet Printhead.

***Claim Objections***

6. Claim 8 is objected to because of the following informalities.

In Claim 8, the phrase of “the first process” (line 5) should be recited as --a first process--. Similar problems occur with the recitations of “the second process” (line 12), “the third process” (line 14), and “the fourth process” (line 16).

Also in Claim 8, the phrase of “its thickness” (line 15) is awkwardly worded and should be replaced with the phrase of --a thickness of the first sheet--.

In Claim 10, the “it” (line 5) should be replaced with the phrase of --the first sheet--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

8. Claims 8-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claim 8, the following phrases each lack positive antecedent basis: “the first sheet” (line 5), “the second sheet” (line 6), “the upper electrode layer” (line 7), and “the lower electrode layer” (line 9).

In Claim 9, the phrase of “the pliant third sheet” (line 4) lacks positive antecedent basis.

In Claim 13, the phrase “the vibrating means” (line 7) lacks positive antecedent basis.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 8-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Okawa et al 5,639,508.

Okawa discloses a method of manufacturing a piezoelectric actuator comprising: a first process for forming a first sheet (bottom layer 40 in Fig. 4) formed of piezoelectric ceramic pliant materials and a second sheet (top layer 40) formed of pliant predetermined materials of piezoelectric ceramic; forming an upper electrode layer (top electrode layer 42 in Fig. 4) on one surface of the first sheet; forming a lower electrode layer (either one of bottom electrode layer 40 or layer 44) on the other surface or opposite surface of the first sheet; a second process for piling and densifying or drying the first and second sheets having the lower electrode layer between (see col. 5, lines 8+); a third process for polarizing the first sheet in a thickness direction of the first sheet (see col. 5, lines 65+); a fourth process for patterning the upper electrode layer 42 in order to form multiple electrodes corresponding respectively to each of the pressure chamber (32a, 32b, 32c) of the pressure chamber forming unit, which meets all of the limitations of the claimed invention.

Regarding Claim(s) 9, within the second process, Okawa further teaches a third pliant sheet (middle layer 40) in which openings 52 are provided and the third sheet is piled on one surface side of the first sheet and is densified or dried with the first and second sheets.

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Regarding Claim(s) 10, within the fourth process, Okawa further teaches that one surface side of the first sheet is conducted with the patterning of the upper electrode layer so that the first sheet will be separated by openings 52 corresponding respectively to each of the pressure chambers 32a, 32b, 32c.

Regarding Claim(s) 11, within the first and third processes, Okawa further teaches that the piezoelectric material is used as the material of the second sheet and another electrode layer (middle layer 40 or layer 54) is utilized for polarization of the conductive material on the surface sides of the second sheet and a voltage is placed between the upper electrode layer and the electrode layer for polarization where at least the first sheet is polarized (see col. 6, lines 3+).

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okawa et al.

Okawa, as relied upon above in Claim 12, teaches the claimed manufacturing method further including the other surface side of the lower electrode layer, i.e. bottom surface of either one of electrode layers 40 or 44, will be given the function as a vibrating means for generating the pressure for ejecting the ink in the pressure chamber during operation. Okawa does not appear to teach that the lower electrode layer is formed thicker than the upper electrode layer.

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The dimension of relative thickness between the lower electrode layer and the upper electrode layer is considered to be an effective variable within the level of ordinary skill in the art in manufacturing electrode layers of piezoelectric actuators. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided Okawa with a dimensional thickness of the lower electrode layer being greater or thicker than the dimensional thickness of the upper electrode layer, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Furthermore, the relative thickness claimed between the upper and lower electrode layers do not provide any manipulative difference within the manufacturing steps when compared with the prior art method of Okawa.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Dexter Tugbang whose telephone number is 703-308-7599.

The examiner can normally be reached on Monday - Friday 7:00 am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**A. Dexter Tugbang**  
**Primary Examiner**  
**Art Unit 3729**

February 20, 2004